

1960 WEED CONTROL IN FIELD CROPS

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The increase in crop yields as a result of good weed control from wise use of herbicides can mean the difference between profit and loss for farmers in 1960.

The recommendations for each chemical and its use on each crop are specific. The time of treatment and the amount of chemical used determine the degree of weed control, the injury to the crop, and the possibility of chemical residue remaining on or in the crop at harvest.

The chemicals recommended for use on field crops in 1960 are shown in the table. The method of treatment and precautions are important and should be followed.

CORN

At Planting

The application of herbicides in a band over the row at the time of planting is an effective method of reducing normal weed competition and that which develops during rainy weather when cultivation is not possible. Broad-leaved weeds and annual grasses can be controlled for the entire growing season with the newer herbicides.

The most promising chemicals for band treatment are Simazine and Atrazine. In 1960, they will be available as 80 percent wettable powders and possibly as granulars. The recommendation for 1960 is 2 pounds

of actual chemical per acre. This means that $2\frac{1}{2}$ pounds of the 80 percent powder would be needed. If corn is planted in 36-inch rows and the application made in 12-inch bands, the $2\frac{1}{2}$ pounds of chemical would treat 3 acres of corn. If an 18-inch band is used, only 2 acres would be covered.

In Cornell tests, granular formulations have not been as effective as the sprays, and will not be recommended in 1960.

If Simazine or Atrazine is used as a band treatment, cultivation will be necessary to control weed growth between the rows. The number of cultivations will depend upon the nature of the weed growth. More cultivations will be necessary to control quackgrass than broad-leaved weeds. The cultivators should be adjusted to avoid disturbing the treated band or throwing excessive amounts of soil into the row.

Band applications of Simazine will not control quackgrass or the broad-leaved species which come up from old rootstocks or crowns. The problem species that develop in this manner are: dandelion, Canada thistle, perennial sow thistle and chicory.

Because of the low solubility of Simazine and Atrazine, good agitation in the spray tank is necessary to prevent them from settling to the bottom of the tank while spraying.

1960 Chemical Weed Control Recommendations

Department of Agronomy

Crop: The explanation under each crop refers to the stage of growth of the crop and not the weeds present. For example: Pre-emergence on corn is after the corn is planted but before it emerges. Some weeds may be already up.

Chemicals:

The chemicals listed in the table are those on which sufficient information (effect on soil, reaction on weeds and residue) is available to make recommendations. Many other chemicals are being tested which look promising for specific weed problems. These can only be recommended when research information is available to justify their use.

Rate per Acre:

The rate per acre column in the table is in terms of active ingredient or actual chemical to be applied. Commercial products vary in the pounds or percent active ingredient per gallon or pound. Check the label of the product being used. The following table will be helpful in determining the amounts needed.

Amount of Water:

The amount of water used per acre will vary with the chemicals applied. Where 30 gallons is recommended, this is the minimum amount desirable for good coverage based on the nature of the chemicals involved. More than this amount can be used if equipment is available with greater capacity. Except where the amount of water is specifically limited, the quantity suggested in the table can be exceeded with equal results.

CHEMICAL	NATURE OF FORMULATION	POUNDS OR PERCENT ACTIVE INGREDIENT PER GALLON OF COMMERCIAL PRODUCT	AMOUNT OF ACTIVE INGREDIENT REQUIRED TO TREAT 1 ACRE	AMOUNT OF COMMERCIAL PRODUCT REQUIRED TO TREAT 1 ACRE
Aminco Triazole Ammate	Powder	50 percent	2 pounds	4 pounds
Atrazine	Powder	80 percent	80 pounds	100 pounds or 4 1/3 pounds per gallon of water
Dalapon	Powder	74 percent	2 pounds	2 1/4 pounds
Dow Premerge MCP	Liquid	3 pounds	3 pounds	4 pounds
Simazine	Liquid	2 or 4 pounds	7 pounds	9 pounds
Sinox P.E.	Powder	80 percent	10 pounds	13 pounds
2,4-D Amine	Liquid	3 pounds	1 1/2 pounds	1 3/4 quarts
	Liquid	4 pounds	1 3/4 pounds	1 quart of 2-pound or 1/2 pint of 4-pound formulations
2,4-D Ester	Liquid	2 or 4 pounds	2 pounds	2 1/4 pounds
2,4-D + 2,4,5-T	Liquid	2 or 4 pounds	3 1/2 pounds	1 quart of 2-pound or 1/2 pint of 4-pound formulations
2,4,5-T	Liquid	4 pounds	4 pounds	1 quart of 2-pound or 1/2 pint of 4-pound formulations
2,4,5-TP	Liquid	4 pounds	2 pounds	2 1/4 pounds
4(2,4-DB)	Liquid	2 pounds	2 pounds	1 quart of 2-pound or 1/2 pint of 4-pound formulations

CROP	CHEMICAL	RATE PER ACRE	REMARKS
CORN At planting	Simazine or Atrazine	2 pounds per acre in 30 gallons of water	Mount spray nozzles on planter packer wheel. Spray 12-14 inch band directly over row. The 30 gallons of solution will treat 2-3 acres. Good control of broad-leaved weeds and annual grasses for the season. Application in spray tank is necessary. Atrazine may be less effective if dry weather with Nodules.
Pre-emergence 3 to 5 days after planting	2,4-D low volatile ester	1 1/4 pounds in 5 to 15 gallons of water	Use pre-emergence only on heavier soils. Injury often occurs on light soils if rain follows treatment. Low volatility ester safer and more effective than other pre-emergence products. Pre-emergence treatments may prevent early cultivation. May be ineffective if dry weather follows treatment.

An effective agitator must be placed in the spray tank for this purpose. Low cost jet agitators can be purchased along with the band applicator kits. If the jet agitator is used, a fitting should be placed in the pressure line between the pump and the pressure regulator and a hose returned to the tank for the agitation. The agitator should not be placed on the end of the by-pass hose, which is the usual source of return liquid for agitation.

Some difficulty has been experienced in using Atrazine or Simazine because of improper screen size on the suction hose and in the nozzles. If 20 to 30 gallons of liquid are used per acre of soil covered, a 60 to 80-mesh screen on the suction and 50-mesh in the nozzles are recommended. The use of 100-mesh screens in either the suction line or the nozzles will increase the frequency of clogging, delay planting and result in spotty weed control.

In 1959, many farmers dumped dry wettable powder directly into the spray tank. This contributes to poor mixing and screen clogging. Fewer problems will be encountered if a slurry is prepared in a pail and strained into the tank. The tank should be partly filled before adding the slurry and the pump should be running to provide agitation.

Pre-emergence

Pre-emergence treatments should be applied 3 to 5 days after the corn is planted but before it emerges. Pre-emergence applications, like those made at planting, are good insurance

against overgrowth of weeds if, after the corn emerges, a rainy period prevents early cultivation or spraying.

If broad-leaved weed species are the main problem and corn does not follow corn in the rotation, 2,4-D low volatile ester should be used. Unless heavy rains follow spraying, 2,4-D can be used on most soils in New York without damage. It should not be used on the sandy soils.

If corn follows corn in the rotation and there is a history of annual grass infestation, the use of Simazine or Atrazine should be considered. Applications of 2 pounds of actual chemical per acre will control the broad-leaved and annual grass species. Atrazine is preferable to Simazine because it may be effective on a wider range of weed species. The idea that Atrazine is more soluble and would have a shorter residual in the soil has not been conclusively demonstrated. The difference in solubility favors Atrazine, but its significance under field conditions needs further study.

If Atrazine or Simazine are used as overall sprays on corn, the chances of establishing a grass or legume cover crop are questionable. If a cover crop is needed for green manure or for erosion control, use the band treatment at planting.

The equipment used for overall pre-emergence applications would normally be a boom-type sprayer with 9 to 15 nozzles. Because of the increased amount of total pump capacity going to the boom, the volume of liquid returning through

the overflow to the tank will not provide the necessary agitation. Because good agitation is essential, the modification as discussed under band spraying is very important.

Post-emergence

A major portion of the corn acreage sprayed by New York farmers each year has been done post-emergence. It is more economical and allows time to determine the nature of the weed problem. Unfortunately, too many farmers wait too long before spraying, and get poor weed control with increased damage to the corn. Small weeds are easiest to kill and small corn is most resistant to damage.

The most economical post-emergence treatment is 2,4-D. Applications should be made when the corn is 2 to 10 inches tall. Because 2,4-D will not control the grasses, cultivation is necessary if annual and/or perennial grasses are present. Many farmers are using 2,4-D where grasses are the major problem. This is not a recommended practice. If the costs of spraying were invested in additional cultivations, the resulting weed control would be significantly better. Frequent cultivation with properly adjusted equipment is the only method of checking quackgrass in corn that is up.

Several other chemicals look promising for the control of specific weed problems in corn. They have not been included here because they lack clearance. Some of the most promising may be ready by corn

planting time and could then be used. Recommendations for use appears on the label. Read the label carefully and observe the precautions.

SMALL GRAINS

The nature of the weed problem in small grains varies, depending upon whether the grains are fall or spring planted. In winter wheat and barley, the weed problem is yellow rocket, corn cockle, dog fennel, chicory, chickweed and quackgrass.

In spring oats and barley the major weed problems are mustard, wild radish, ragweed, lambs-quarters, wild morning glory, milkweed and thistles.

The control of weeds in small grains is complicated by the normal practice of seeding legumes in or with the small grain. The susceptibility of alfalfa and birdsfoot seedlings is equal to or greater than most of the weed species. The application of herbicides must be governed by the kind of legume, the stage of growth, weather conditions, and the seriousness of the weed problem.

Winter Wheat or Barley

Because the legumes are broadcast on the surface when seeded on winter grain, the use of herbicides should be delayed in the spring until after the seeding is made and the small grain and weeds have developed sufficient canopy to protect the germinating legume seedlings. The recommended amount of chemical and the volume of water used per acre must be followed if injury is to be prevented.





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corn 8 to 10 inches tall	2,4-D low volatile ester	34 pound	are most susceptible. Some leaf rolling may occur. More noticeable where hot, dry weather follows treatment. Do not cultivate for 10 to 14 days following treatment, as corn may be brittle.
Post-emergence (Lay-by) corn 10 to 24 inches tall	2,4-D amine or Ester	34 pound in 5 to 15 gallons of water	Not a recommended practice as an over-all spray. For emergency cases where earlier weed-control measures were not performed or were unsuccessful and where a specific weed infestation is serious. Use drop pipes and keep spray off corn leaves.
OATS or SPRING BARLEY Seeded: Grain 2 to 6 inches tall	Dow Premerge or Sinox P.E.	1 1/4 pounds in 30 gal- lons of water	Treatment must be applied when weeds are seedlings. Slight to severe burning of oats may occur, depending on temperature. Recovery of seedlings of oats not as important as that of weeds. The weeds must be seedlings.
Grain 6 to 15 inches tall Good canopy essential	2,4-D amine MCP amine	3/4 pound in 5 to 7 gallons of water	Canopy of weeds and oat plants to protect legume is essential. Control of weeds in alfalfa and lucerne is most important. Use of spraying equipment. Alfalfa and birdsfoot trefoil most susceptible. Red clover most resistant. Keep pressure down (from 30 to 40 pounds). Do Puits alfalfa difficult to cover by canopy.
Not seeded: Grain 4 to 10 inches tall	2,4-D amine	3/4 to 1/2 pound in 5 to 15 gallons of water	If most of weeds fall in early-to-late stage, use 3/4 pound. Where birdsfoot trefoil is present or spraying is on late side, use 1/2 pound. 2,4-D amine is most economical chemical available. Oats most susceptible of cereal grasses, barley most resistant.
SUDAN GRASS	See recommendations for oats and spring barley		Chemical treatment may stunt sudan grass. Allow at least one foot of growth after treatment before grazing. Danger of phytotoxic poisoning. See precautions for legumes in oats and barley, above.
WINTER WHEAT on Fall treatment to be spring seeded to legume	2,4-D amine	0.3 pound in 5 to 15 gallons of water	Fall treatment has resulted in injury to crop. Crop should be at least 4 to 6 inches tall before treatment. Yellow rosette or yellow rosette or vetch is serious problem and legume seedling to be made in early spring.
Spring treatment not needed to legume	2,4-D amine	3/4 to 1/2 pound in 5 to 15 gallons of water	Apply just before jointing. Avoid treatment in "joint" or "boot" stage. Has given least injury at full tiller stage (5 to 8 inches). Amount of chemical depends on kind of weeds.
Spring treatment after legume seed- ing	2,4-D amine or MCP amine	3/4 pound in 5 to 7 gallons of water	Canopy of crop and weeds important. Apply just before jointing or at full tiller stage to get best possible canopy. Keep pressure down to 30 to 40 pounds. Alfalfa and birdsfoot trefoil most susceptible legumes.
NEW or ESTAB- LISHED SEEDINGS of clover, alfalfa and birdsfoot trefoil	MCP	3/4 pound in 5 to 7 gallons of water	Fall treatment (September 15 to October 15) gives satisfactory control of late-summer and early-fall-germinated yellow rosette without significant reduction of clover. Alfalfa, if in the mixture, will be somewhat reduced.
PERMANENT PASTURES	No chemicals have yet proved satis- factory for weed control in these two legumes		Grass stage is still the most effective method of handling the first cutting of fields infested with yellow rosette, white cockle, and other weeds.
Good manage- ment	Mowing machine, harrow, roller		Chemical treatment is not a substitute for good management. Running of mowing machine and harrow should be continued between cuttings of pastures after each grazing period or at least twice per season reduces the weed problem.
2,4-D low volatile ester or amine		1.0 pound in 10 to 20 gallons of water	The percentage control depends on the weed species present. More than one treatment is normally required to control perennial pasture weeds. Many of the more resistant ones cannot be controlled using 2,4-D.
Chemical Renovation For Trial Use	Dalapon	10 pounds. For con- trol of weeds in seedling alfalfa and 2,4-D	This is not a general recommendation for New York. Some interest has been shown, and in experiments at other stations the method has shown promise. The method is not a replacement for plowing where weeds are present in pastures. The method is not recommended for moved areas. Thorough discing from 4 to 6 weeks after treatment recommended. Use of treatment on low-value land questionable be- cause of cost.
GRASS CONTROL Birdfoot, Trefoil Seed Production	Dalapon (Spray application)	3 pounds per acre in 30 gallons of water	Use only on areas for seed production. Present regulations prevent feeding the treated hay or straw to milking cows or beef animals for slaughter. Tanque more resistant than Viking. Stage of treatment impor- tant. Treat before average height exceeds 5 inches regardless of variety.
PERENNIAL WEED CONTROL			
BEEDSTRAW (Spot treatment)	2,4,5-TP	2 to 3 pounds per acre	Use only as a spot treatment in forages. Do not use on areas where live- stock are grazing or where the forage is to be fed to livestock. Spraying applications more effective than fall. Use heavier rate recommended if

BEDSTRAW (Spot treatment)	2,4,5-T	2 to 3 pounds per acre	Use only as a spot treatment in forages. Do not use on areas where live-stock are grazing or where the forage is to be fed to livestock. Spraying applications are more effective than fall. Use heavier rate recommended if applied in fall.
	2,4-D	$\frac{1}{2}$ to 1.0 pound in 10 to 15 gallons per acre	Treatment of chicory in fall or spring while the plants are in the vegetative stage and before the first frost is most effective. Apply at 10 to 15 gallons on more mature plants. Fall treatment desirable. Community or county control programs recommended.
Milkweed (spot treatment)	Amino Triazole	2 pounds actual chemical in 50 gallons of water	Amino Triazole is the most promising chemical to date on milkweed. "Spot" treatment should be used. Small grains or grasses adjacent to milkweed plants will be damaged. Thorough coverage of entire plant essential. Spraying in late spring or early summer, cutting and spraying prior to seed formation reduces spread.
Quackgrass	Dalapon	7 pounds (9 pounds of elemental as purchased)	Apply in early spring when quackgrass has made 3 to 6 inches of growth. Apply 3 to 5 days later. Under New York conditions an interval of 4 weeks between plowing and planing is necessary to avoid injury to the corn. Frequent cultivation will improve control.
Smartweed (spot treatment)	4(2,4-DB)	2 pounds	Use only where smartweed is main weed problem. Apply as early post-emergence treatment. More effective on smartweed than other chemicals available.
Thistles	MCP or 2,4-D ester	1.5 pounds per acre in 10 to 30 gallons of water	MCP more effective for thistle control than is 2,4-D. An application of 1.5 pounds during pre-bloom stage has been most effective. Use enough water to wet the entire plant. A combination of mowing and chemical treatment speeds up control. Spot treatment recommended rather than a full coverage essential.
Wild Onion	Amino Triazole (Spot treatment) 2,4-D ester	2 pounds in 50 gallons of water per acre $\frac{1}{2}$ to 1 $\frac{1}{2}$ pounds per acre	Has looked good in trials in other areas. Apply at bud stage. Thorough coverage essential.
WOODY PLANTS (Summer foliage spray) (roadides, fence-rows, pastures, brush, woods, and the like)	2,4-D + 2,4,5-T followed by 2,4,5-T if necessary	6 pounds in 150 gallons of water	Control is difficult. One treatment is not enough. Treatment of wild onion in pastures in the spring and fall over a 3-year period gives results. Spot treatment can be used for scattered plants. In alfalfa, $\frac{1}{2}$ pound of 2,4,5-T applied in the spring reduces the number of aerial tillers formed.
	Amimate	80 pounds in 100 gallons of water or $\frac{1}{4}$ pound per gallon of water	Effective treatment for brush from 4 to 6 feet tall. Taller brush should be cut and treated. One or two treatments are needed. Some of all plants must be thoroughly wet. Use 2,4,5-T in oil as follow-up basal spray to get the difficult-to-kill species not controlled by foliage treatment. Keep livestock off areas where chokecherry or wild cherry have been sprayed. Be careful of drift to susceptible crops.
As basal spray	2,4-D + 2,4,5-T or 2,4,5-T	6 pounds in 40 gallons No. 2 diesel fuel 4 pounds in 40 gallons No. 2 diesel fuel	One application of amimate as effective as 2,4-D + 2,4,5-T. Amimate is a contact herbicide and kills or injures all above-ground parts which it contacts. The use of a spread-sticker normally gives better coverage and, therefore, better control.
Stump treatment	2,4-D + 2,4,5-T or 2,4,5-T	8 pounds in 40 gallons No. 2 diesel fuel 6 pounds in 40 gallons No. 2 diesel fuel	For best results, a uniform cover on the trunk or stem of plant from ground line to height of 18 inches is recommended. Basal spray gives as good or better control than foliage. Can be applied throughout season. Good timing of application is important. Good kill is the result of good coverage. An excess of spray to run down on roots essential.
POISON IVY	Amino Triazole	2 pounds active in 100 gallons of water	Results best when applied immediately after cutting. Root crown, exposed roots, sides, and cut surface of stumps must be covered. An excess of spray to run down on the roots essential.

Spraying should be done after leaves are fully developed in late spring and summer. Plants should be thoroughly wet. Be careful to avoid drift to adjacent valuable plants.